# STATUS OF FOREST INSECTS
# SAWTOOTH NATIONAL FOREST - 1965

During 1965 forest insect infestation occurred on the North and South Divisions of the Sawtooth National Forest. For the most part bark beetles caused the greatest losses, and at the present time constitute the bulk of insects doing economic damage to timber stands. In direct contrast to this defoliator problems, principally the spruce budworm, showed signs of dropping off during 1965.

The following information has been accumulated through aerial detection survey flights and followup on-the-ground biological evaluations during the past field season. This report will consist of three parts: bark beetles, defoliators, special section--storm damage.

## BARK BEETLES

Bark beetle problems on the Sawtooth National Forest are centered around attacks to lodgepole pine by the Black Hills beetle.1/

In the past three years several areas on the North and South Divisions of the Sawtooth National Forest have shown a slow but steady buildup of Black Hills beetle populations in lodgepole stands. During 1965 the beetle showed a finite tendency to increase its attack intensity, and as a consequence ral areas of relatively high population levels are currently present.

On the southern portion of the Sawtooth Forest, primarily the Cassia Division, Black Hills beetle populations built up in group-type infestations in 1964 to fairly high levels. 1965 ground biological evaluations show that the increase ratio of new attacks to old attacks averages about 3 to 1.

Lodgepole pine stands on the Cassia Division have a rather lengthy history of Black Hills beetle infestations. Beetle populations have periodically built up to epidemic proportions, then due to natural factors and limited control operations have dropped off to low levels of activity. In the past two years populations have shown a slow but steady tendency to increase. Evaluation of this year's attack centers show that the beetles are making aggressive attacks in several locations. In all areas examined attack intensities have increased over what was observed last year. For the most part larger diameter mature to overmature age class pines are being hardest hit. Broods within these trees are relatively high and average 140-160 per square foot of bark surface. This is a significant increase over what we have observed in the last two years. There are some attack centers where one

1/ Recent taxonomic revisions have changed the mountain pine beetle, Dendroctonus monticolae Hopk., to Black Hills Beetle Dendroctonus ponderosae Hopk.

new tree was found for every tree attacked last year. Conversely, there are areas where attacks run as high as four new trees for every tree that was killed last year. Overall the buildup ratio averages three new hits for every 1964 attack. Estimates obtained from survey aircraft coupled with ground observations indicate that approximately 3,500 trees are currently infested on the Cassia Division.

On the Northern Division of the Sawtooth Black Hills beetle populations are active in several drainages west of Ketchum. Biological evaluations were made in these areas, and heaviest infestations were found in Castle Creek, Placer Creek, Little Fork of Warm Springs Creek, Trouble Canyon, Meadow Creek, Cabin Gulch, and the South Fork of Warm Springs Creek. In addition several small group-type infestations were located on both sides of the main Warm Springs road from Alturas Gulch to Dollarhide Summit. This is a highly used Travel Influence Zone. Infestations in the foregoing areas have been showing signs of slow but steadily increasing activity for the last three years. Currently an estimated 2,200 trees are infested. Attack centers on the Northern Division of the Sawtooth vary somewhat as far as brood counts are concerned from area to area. Subcortical bark samples show broods averaging 100-125 per square foot. In other locations counts averaged 140-165 per square foot. While making brood counts it was observed that there was a relatively low level of predators and parasites. Even though present populations appear to be slightly lower than were found on the Southern Division, biological potential for increased beetle depredation to lodgepole pine stands exists.

In addition to the aforementioned infestation centers Black Hills beetle populations are currently active in lodgepole pine down the north side of Couch Summit along Little Smoky Creek, and in the Smoky Bar summer home area. Evaluations show approximately 250-300 newly attacked trees with brood densities averaging 180 per square foot. Also, the ratio of new trees to old trees is about 3 to 1. Sampling showed that parasites and predators are at a low level. These factors coupled with the buildup ratio indicate that the beetles will maintain a fairly high level during the 1966 season unless suppression action is initiated.

In consideration of all biological factors encountered during the evaluation period on the North and South Divisions of the Sawtooth National Forest it is felt that suppression would be justified to protect the existing lodgepole pine resources and esthetic values that are currently being threatened by Black Hills beetle populations.

Since 1938 epidemic populations of the Douglas-fir beetle have been causing severe losses to Douglas-fir stands on the Sublett Division. In 1961 a large sale was let of over 10,000 acres. The purpose of this sale was to remove as much beetle-infested timber as possible and to take green overmature and mature age class trees from the stand, thus rendering it less susceptible to bark beetle attacks. From 1961 to 1964, over 9 million board feet of infested and green material were removed. 1965 logging activity continued during the calendar year and 4,380,000 board feet of the infested green

material were removed. Ground checks throughout the Sublett Division showed that the Douglas-fir beetle is still active, however, attack intensities appear to be dropping off. It is hoped that the reduction in total numbers of beetles within infested stands by logging will materially help in lowering the attack potential for the 1966 field season. It was also observed that in the heavier cutting areas smaller diameter trees were successfully pitching out beetles, and attacks in these stands appeared to be dropping off.

During this year's aerial survey flights it was observed that approximately 2,500 to 3,000 trees were fading. If the attack ratio continues at a 1 to 1 or a 2 to 1 level, continued losses during the 1966 field season are to be expected. Ground evaluations show that beetle attacks are still at epidemic levels, and the infestation is expected to persist for at least another year.

Except for a few small groups of 2 to 10 trees each Douglas-fir beetle activity appears to be on a downward trend on the Sawtooth National Forest. This, of course, is with the exception of the Sublett Division. For the most part the small group infestations found during this year's aerial surveys appeared to be associated with older known areas of infestation. There is a chance Douglas-fir beetle centers may develop during the 1966 field season from wind and snow damage that occurred in December 1964. This is covered in more detail in the special report on storm damage.

DEFOLIATORS

During the past decade spruce budworm populations on the Sawtooth National Forest have persisted in Douglas-fir and true fir stands within a ten-mile radius of Big Smoky Guard Station. Infestations in this area have shown a decided tendency to fluctuate in intensity in high and low periods averaging two to three years apart. Entomological observations of the infestation show that the fluctuations have probably been brought about by cyclical buildups of predators and parasites. Also, adverse weather conditions on two occasions have drastically reduced population levels. In these instances torrential rains and hailstorms drowned or battered to death considerable numbers of adult moths before they had a chance to ovaposit. As a consequence the preceding year's populations were reduced to low levels.

Starting in 1961 budworm populations showed a steady increase until 1963. From 1963 to 1964 there was a slight reduction in trees affected. From 1964 to 1965 a somewhat drastic reduction in total acreage of affected Douglas-fir and true fir type was observed. Aerial observations in 1965 showed that slightly over 9,000 acres were defoliated. This represents a six-fold decrease in total area infested from 1964 to 1965. Following is a table summarizing the last five years budworm activity on the forest:

| Year | Light | Medium | Heavy | Total |
|---|---|---|---|---|
| 1961 | 5,000 | 3,000 | 5,000 | 13,000 |
| 1962 | 4,000 | 10,000 | 27,000 | 41,000 |
| 1963 | 14,720 | 25,440 | 20,000 | 60,160 |
| 1964 | 32,000 | 21,000 | 1,000 | 54,000 |
| 1965 | | 9,000 | | 9,000 |

From egg mass surveys made during 1965 it is predicted that approximately 60% of the area will have defoliation ranging from 25 to 50 percent; 20% will be defoliated from 51 to 90 percent; the remaining 20% is expected to be defoliated from 90-100 percent. These figures represent the defoliation that is expected to occur on next year's new growth. Specific predictions for individual areas are given in the following table:

| | 1965 Defoliation | | 1965 Collections | | Expected | |
|---|---|---|---|---|---|---|
| | | | Egg Masses | Pupal | Defoliation | |
| | Predicted (%) | Actual (%) | (1000 sq. in.) (No.) | Density (Class) | 1966 (%) | Trend |
| Fleck Summit So. | 51-90 | 90 | 20.2 | IV | 90-100 | Increasing |
| Fleck Summit No. | 51-90 | 90 | 12.7 | IV | 51-90 | Increasing |
| Bounds Creek | 51-90 | 75-90 | 5.8 | III | 25-50 | Static |
| Little Smoky Cr. | 15-25 | - | 6.0 | - | 25-50 | Static |
| Couch Summit | 51-90 | 75-90 | 7.3 | III | 25-50 | Static |

In summary the Sawtooth infestation has undergone a drastic reduction in total acreage defoliated during 1965. Population reductions were probably brought about by natural biological control agents and adverse climatological factors that were unfavorable for optimum budworm development. At the present time, however, there is sufficient residual populations present that will cause defoliation during next year.

## SPECIAL REPORT--STORM DAMAGE

### SNOW AND WIND DAMAGE

In late December 1964 unseasonably warm weather accompanied by relatively heavy rains caused rapid snowmelt and thawing of the ground. Following the rain and thaw period strong winds and snow felled thousands of Douglas-fir and damaged ponderosa pine over a wide area.

In March 1965, a special aerial survey was made of the forest to determine whether the damage had been concentrated and approximately how much area con-

tained downed timber. Aerial observers found that relatively few extensive areas of felled trees could be located. However, many thousands of acres of forest land had storm-thrown timber averaging from 1 to 150 stems per acre. Damage was primarily confined to north-facing slopes containing a high quantity of Douglas-fir and true firs. The rootballs of much of the wind-thrown fir remained intact. This meant the trees would undoubtedly stay in a semi-moist condition throughout the summer which provided a very good source of host material for bark beetle buildups. In ponderosa pine the damage was more or less confined to top and limb breaking. In a few cases, however, entire trees were toppled.

Entomological evaluations of the condition of downed timber were made during the fall in as many locations as were physically possible. As would be expected with damage of this type scattered over such a large area, beetle buildups have varied considerably from location to location. Almost without exception where Douglas-fir trees were encountered the Douglas-fir beetle had started relatively heavy buildups in the lower 180° of the tree's bole. Also, where trees were in a semi-moist condition the buildup continued throughout the full 360° of the tree's circumference. Several locations were checked for ponderosa pine damage. Limbs and tops that had been broken and some whole trees that had gone down were examined. Black Hills beetle populations were building up in the lower 180° of the downed material. The top 180° was filling in with Ips. Bark beetles that have attacked downed material this year are expected to emerge and make attacks to uninfested downed material. Also, the possibility of standing tree infestations exists. At the present time there is no way possible to estimate the number of infestation centers that may develop. Similarly there is no way to estimate the intensity of such attacks because of brood survival, parasitism, predator action, and climatological factors either for or against the beetle development. An attempt will be made to re-examine some of the more troublesome areas during the 1966 field season, and you will be kept informed of our findings.